Normal Model:

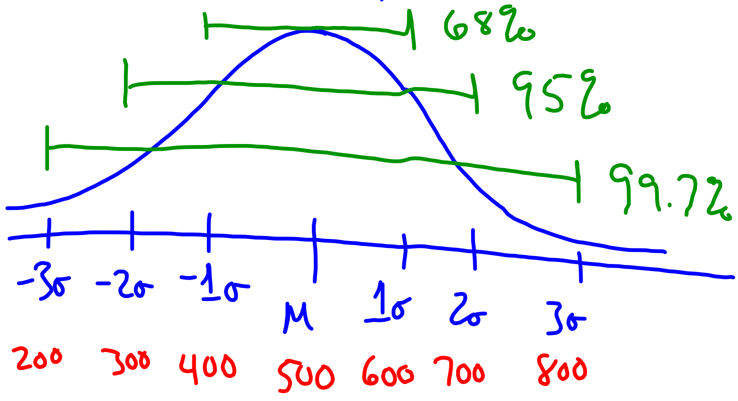
- Z-Scores
  - standardized values of a normal model
  - equation: $z = \frac{y - \mu}{\sigma}$
    - $z \rightarrow$ z-score
    - $y \rightarrow$ given value
    - $\mu \rightarrow$ mean, expected value
    - $\sigma \rightarrow$ standard deviation
  - z-scores can be negative or positive
  - Calculator

    DISTR (2nd VARS) $\rightarrow$ 2: normalcdf(

    normalcdf(left z-score, right z-score)

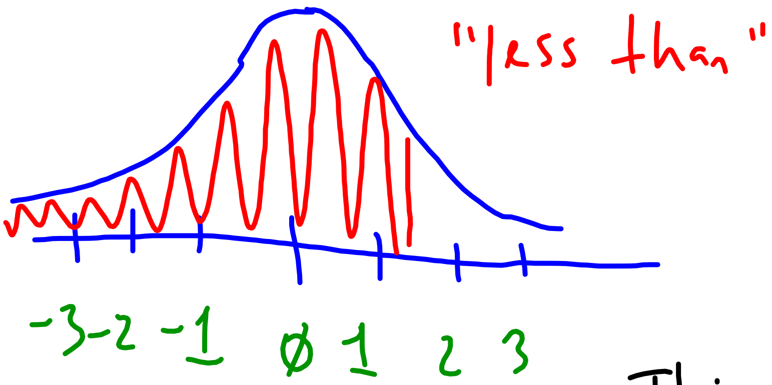
- Notation
  - $N(\mu, \sigma)$
    - $\mu \rightarrow$ mean, expected value
    - $\sigma \rightarrow$ standard deviation

- Normal Model: $N(500, 100)$



Worksheet 16-17/18 :

a. $z = \frac{y - \mu}{\sigma} = \frac{165.4 - 151.7}{11.6} = 1.181$



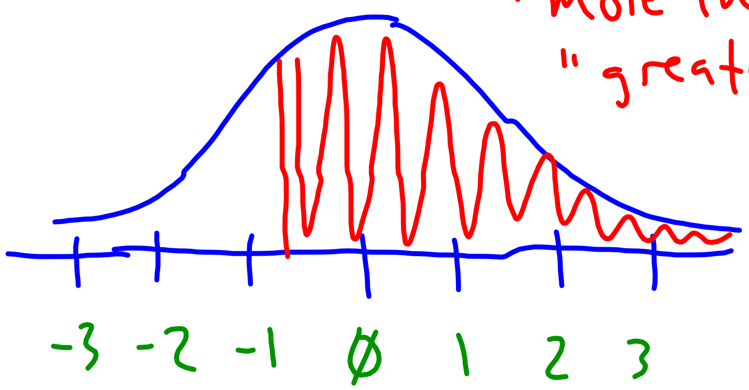
This # is a probability

$P(X < 165.4) = 0.881$

[normalcdf(-99, 1.181)]

b. $z = \frac{y - \mu}{\sigma} = \frac{50 - 65}{21.2} = -0.71$

"more than"
"greater than"



$P(X > 50) = 0.76$

[normalcdf(-0.71, 99)]

Before a blood drive, a local Red Cross agency puts out a plea for universal donors, hoping that they'll get more than the usual 6% among the donors who show up. That day they collected 202 units of blood, and among them 17 units were Type O-negative. Does this suggest that making a public plea is an effective way to get more O-negative donors to come to blood drives? (p.358-359)

Goal → to see if 17 donors is statistically significant

X = number of O-negative donors = 17

10% Condition: (sample < 10% of population)

202 < 10% of all donors

Success/Failure condition:

$p = 0.06$

$n = 202$

$np = (202)(0.06) = 12.12 > 10$ ✓

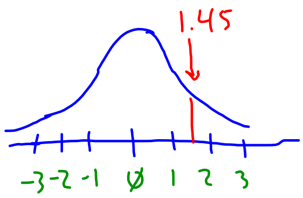
$nq = (202)(0.94) = 189.88 > 10$ ✓

Both conditions work, so it is okay to use the Normal Model.

$\mu = E(X) = np = 12.12$

$SD(X) = \sqrt{npq} = \sqrt{(202)(.06)(.94)} = 3.375$

$z = \frac{x-\mu}{\sigma} = \frac{17-12.12}{3.375} = 1.45$



∗ To be "statistically significant," z-score must be outside of $\pm 2\sigma$.

z = 1.45 is NOT statistically significant, so advertising did not work as planned.